ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of Advanced Television Systems and their Impact on the Existing Broadcast Service	)	
Review of Technical and Operational Requirements Part 73-E, Television Broadcast Stations	)	MM Docket No. 87-268
Re-evaluation of the UHF Television Channel and Distance Separation Requirements of Part 73 of the Commission's Rules	)	

To: The Commission

COMMENTS OF SONY CORPORATION

Tom W. Davidson
Margaret L. Tobey

SIDLEY & AUSTIN
1722 Eye Street, N.W.
Washington, D.C. 20006
(202) 429-4000

November 30, 1988

0+5

TABLE OF CONTENTS

SUMMARY

Sony Corporation ("Sony") welcomes the timely release of the Federal Communication Commission's Tentative Decision and Further Notice of Inquiry on Advanced Television Systems ("Further Notice") and strongly supports the conclusion reached therein that the U.S. public would benefit from a terrestrial advanced or high definition television ("ATV" or "HDTV") broadcast service. As a major manufacturer of video equipment (including most of the prototype HDTV equipment on which tests have been conducted to date), Sony has a unique perspective on the complex technical issues raised in the Further Notice, which differs somewhat from the perspective of U.S. broadcasters, regulators, and others who are now focusing their attention on transmission and distribution issues.

In particular, Sony wishes to emphasize, as it has in the earlier phases of this proceeding, the critical importance of establishing a single worldwide standard for HDTV program production. The nine broadcasting unions of the world supported such a standard at their 1983 Algiers meeting because they recognized that only a uniform production standard would assure universal program exchange across international borders, enhanced worldwide communication, and the economies of scale made possible by fully compatible production equipment employed around the world. Today, as the specter of proliferating transmission and

distribution standards around the world grows more real, it is even more critical for the industry to strive for a single, unified production standard that can be electronically converted to all of the diverse delivery systems, including the existing NTSC system in the U.S. Accordingly, we urge U.S. broadcasters to re-focus their attention on this worthy goal and to avoid the kind of parochial narrowing of sights that could result in a multiplicity of discrete and incompatible production and transmission systems in the U.S. to the detriment of this exciting new service and the interests of the American public.

With respect to the setting of transmission standards, we agree with the Commission that it would be counter-productive at this time to repeal the NTSC standard and that it is premature to adopt a mandatory HDTV transmission standard or standards. Furthermore, we believe that when such a standard is adopted, it must be based on an industry-wide consensus following extensive laboratory testing of the various alternatives. Therefore, we urge all concerned parties to devote their energies and resources to prompt implementation of a well-planned test program.

The many thoughtful questions posed by the Commission in the Further Notice underscore the urgent need to move away from theoretical analyses of HDTV and to begin large scale testing of HDTV hardware in laboratory settings. Now that the Commission has tentatively concluded that it will consider only those ATV systems with spectrum plans employing no more than 6

MHz of additional bandwidth, it is imperative to begin testing of prototype systems that comply with this restriction. We are very concerned that the established timetable for testing is inadequate and already slipping, and we urge the Commission to take whatever steps are necessary to extend the time for testing and to ensure that the FCC Advisory Committee on ATV has an uninterrupted authorization to complete the necessary test program.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of Advanced Television Systems and their Impact on the Existing Broadcast Service Review of Technical and Operational	)))))μ78V
Requirements Part 73-E, Television Broadcast Stations	) MM Docket No. 87-268))
Re-evaluation of the UHF Television Channel and Distance Separation Requirements of Part 73 of the Commission's Rules	))))

COMMENTS OF SONY CORPORATION

Sony Corporation ("Sony") hereby submits its comments on the Tentative Decision and Further Notice of Inquiry on Advanced Television Systems released by the Federal Communications Commission ("FCC" or "Commission") on September 1, 1988 (FCC 88-288) ("Further Notice").[1]

I. INTRODUCTION

Sony welcomes the timely issuance of the Further Notice on advanced and high definition television systems ("ATV" and "HDTV"). Released soon after the publication of the FCC Advisory Committee's Interim Report, the Further Notice reflects an

[1] The Commission extended the filing deadline for initial comments to November 30, 1988, and for reply comments to January 9, 1989.

activist Commission signalling to the industry that it intends to be directly involved in the historic changes occurring in the U.S. television industry. The Commission responded swiftly and positively to the U.S. broadcast community's recognition that the advent of the HDTV era was a critical turning point for the unique American broadcasting system.

The Further Notice concluded that the U.S. public would benefit from a terrestrial ATV broadcast service and that ATV technology, with its promise of a much enhanced television experience, would be expedited to the U.S. public by the active involvement of existing broadcasters. Sony strongly endorses both conclusions. The U.S. boasts the world's most vibrant terrestrial broadcast system, coupled with the world's most energetic and ubiquitous program production activity. It is therefore hard to imagine a future U.S. society deprived of the next great leap forward in the television viewing experience. The last major breakthrough in television technology -- the development of color television service -- was a creature of the engineering ingenuity and marketing prowess of U.S. broadcasters. Today's U.S. broadcasters must be similarly involved in the development of the next major breakthrough in television imaging and the delivery of this very significant new service to U.S. households.

At the same time, however, HDTV must be viewed as a development of global proportions with applications far beyond

home entertainment. In our Reply Comments filed on January 19, 1988, in response to the first Notice of Inquiry in this proceeding ("Reply Comments"), Sony described to the Commission in detail its broader perspective on HDTV. We stressed that the broadcast television developments now unfolding cannot be viewed in isolation. HDTV is a new electronic imaging technology with dramatic implications for the global society of the 21st century. Enhancement of home entertainment is one vital aspect of the dramatic changes that will be wrought by this technological innovation -- but only one aspect. The HDTV technology currently being developed will have wide and immediate application in industrial, educational, medical and other settings around the world. Further, we can expect this technology to evolve rapidly in ways not yet envisioned. To permit the full potential of HDTV technology to be realized will require all affected sectors of the communications industry -- broadcasters, manufacturers, and regulators -- to make decisions now that will allow rapid introduction of new service, while also facilitating future development and expansion of HDTV technology. These decisions must be based on a thorough understanding of the complex technical and other issues raised by HDTV production and of how these issues are distinct from the issues surrounding ATV transmission and distribution.

In creating the FCC Advisory Committee, with its three primary Subcommittees and more than fourteen Working Parties, the

Commission assembled talent from many disciplines within the U.S. communications industry. This highly organized, multi-disciplinary approach reflects an admirable effort by the Commission to examine the complex topic of ATV systematically and from all perspectives. The Further Notice also demonstrates that the Commission has already assimilated a great volume of information provided to it by diverse segments of the communications industry. The many thoughtful queries for comments contained in the Further Notice reflect a genuine desire on the part of the Commission to act decisively in guiding the broadcast industry through a complex maze of options and possibilities in the development of HDTV.

The Further Notice thus provides an excellent platform for the next important step in the early stage of ATV development -- an examination and debate of the issues emanating from the July 1987 Notice of Inquiry in this proceeding and from the June 1988 Interim Report of the FCC Advisory Committee. It is to be hoped that this debate will begin to sharpen the focus of the collective efforts of many during the coming year of intense activity that faces the FCC Advisory Committee, the Commission itself, and the industry.

Sony joins the debate by offering the following comments to the Commission in its search for relevant information and thoughtful examination of the issues. Sony's comments, in some instances, are from a perspective somewhat different from

those more directly engaged in grappling with ATV transmission and distribution issues. But we believe our perspective, described below, is relevant to a careful examination of all the issues that must be resolved in order to make decisions that will provide optimum benefits to future generations who must live with the consequences of this decision-making process.

II. SONY'S PERSPECTIVE ON HDTV

In responding to the Further Notice, Sony will focus particularly on two specific areas of special concern to us -- the development of standards for production and transmission of HDTV programming and the urgent need to move beyond the theoretical stage to the testing of various proposed HDTV systems. Within the area of standards, we will focus particularly on an issue which we anticipate will be only treated only summarily by the majority of respondents -- the topic of production standards for the HDTV program sources required for the ATV transmission/distribution services that will eventually emerge. See Further Notice, ¶ 21. Sony has a unique perspective on this topic because of its position within the maelstrom of events embroiling the international community's examination of HDTV: Most HDTV images seen to date, around the globe, have been originated on our HDTV cameras, recorded on our HDTV VTRs, and displayed on our HDTV studio monitors and projection systems. This fact has endowed Sony with a degree of international HDTV

prominence and, more importantly, substantial first-hand knowledge of the complexities of HDTV production. We will also offer our perspective on certain of the transmission/ distribution, spectrum, and allotment issues raised by the Further Notice.

To appreciate the comments, it is essential to understand Sony's basic assumptions on the development of ATV and HDTV systems. Sony believes that HDTV is inevitable and will be of immense benefit to a global society in the transmission of significantly enhanced video images to homes, factories, businesses, centers of learning and culture, medical institutions and other settings. The successful development of an HDTV service is dependent, however, upon the establishment of uniform standards for HDTV program production, transmission, and distribution through a process of extensive testing and consensus-building by the industry. Specifically, Sony supports the dream of the world's broadcasting unions and technical associations of a single worldwide standard for high definition studio origination and international program exchange as the most desirable foundation for the ongoing search for optimum transmission and distribution methods. We further believe that the issues relating to HDTV studio origination must be clearly separated from HDTV/ATV transmission and distribution issues in order to effectively examine the total HDTV/ATV system and subsequently develop workable standards for each. In addition,

we believe that the separate topic of standards for ATV delivery systems must be examined with great care after thorough testing of alternatives.

Sony recognizes that a subject so immense and complex will generate disparate views and that our views are not fully shared by all within the current vigorous debate in the U.S. Nevertheless, because of our belief that only a unified production standard will enable the full potential of HDTV for worldwide communication to be realized, Sony has committed substantial corporate resources to the pursuit of a single worldwide HDTV program production standard and will continue to do so throughout the year-and-a-half remaining to complete the formal international deliberations on this topic within the International Radio Consultative Committee ("CCIR"). We expand on these points below.

III. PRODUCTION AND TRANSMISSION STANDARDS FOR HDTV

A. Introduction

The Commission has acknowledged the diversity of the various video signal formats being proposed for possible U.S. ATV transmission and distribution systems (Further Notice, ¶¶ 22-37) and has expressly recognized the relevance of proposed ATV program production systems to the quality and likely success of specific ATV transmission and distribution systems that may be adopted. Further Notice, ¶ 21. Accordingly, the Commission has

requested additional information relating to the program production formats that are expected to be employed in the various ATV systems around the world. Id. We discussed this issue at considerable length in our Reply Comments. We specifically incorporate by reference those portions of the Reply Comments (Reply Comments at 10-29) and urge the Commission to reexamine them because they are most pertinent to the Commission's present inquiry. Because the Commission has specifically solicited comment on this very important topic, however, we take this opportunity to again stress our perspective on the issue of HDTV production standards and their importance to the development of acceptable transmission standards and enhanced worldwide communication.

The diversity of transmission and distribution systems proposed within the U.S. represents, on a macro or regional scale, what has always been predicted on a global scale. Transmission formats will of necessity splinter, to some degree, to cope with the spectrum constraints of the various regions of the world and with the transmission characteristics of the diverse electronic media systems proposed for distribution of HDTV signals. During the past six months, U.S. terrestrial broadcasters have been called upon to play a major role in bringing a terrestrial ATV system to the U.S. Although many diverse transmission and distribution systems have been proposed, the Commission has now tentatively mandated that all future U.S.

terrestrial ATV transmission systems must be compatible with the millions of existing NTSC receivers. Further Notice, ¶ 4.

In Europe, on the other hand, it appears clear that the eventual European ATV transmission standard will be exclusively compatible with the newly developed D2-MAC system -- which does not yet exist in practice -- and that transmission will be by satellite rather than terrestrial means. Further Notice, ¶ 15. Thus, two profoundly different ATV philosophies separate these two major regions of the world. The always-envisaged splintering of transmission signal formats has quickly become a reality. This reality need not erect barriers to program exchange and other communication, however, if broadcasters, program producers and manufacturers work together to create and implement a uniform production standard capable of downconversion to all proposed transmission and distribution systems.

B. The Need for a Single Uniform Production Standard

Sony believes that an HDTV production standard must enable program producers to achieve a level of performance that will ensure the widest acceptability of HDTV program material. This means that producers must grapple with such complex production issues as transfer to and from 35mm film (both 24 frame and 30 frame), compatibility with high resolution computer graphics, and digital representation of the HDTV signal and its relationship to the current dual digital studio standard CCIR-601 and to multi-channel digital audio. Coupled with these issues

are the difficult technical issues associated with electronically converting this signal format down to all of the world's present television formats, as well as to a variety of future ATV transmission formats. The current intense debate on disparate transmission scenarios thus draws new attention to the equally important and related topic of the HDTV studio production format.

Unfortunately, what had appeared as a worthwhile goal only five years ago -- to seek a single worldwide HDTV production standard -- now appears threatened by the same political and trade-related factionalism that splintered the developing world of color television in the 1960s. In the heat of the current discussion, many have forgotten the premise upon which the original goal of jointly striving to develop a single world standard for HDTV production was based -- the ease of program exchange across borders and the economies of scale made possible by compatible production equipment worldwide -- in short, the overall enhancement of international communication. As we discuss below, Sony believes that the attention of the industry and the Commission must be re-focused on the question of production standards since such standards provide the foundation for all subsequent ATV delivery systems.

When the CCIR inaugurated its 1982-86 study of HDTV, it was with a clear recognition that HDTV transmission would necessarily encompass a variety of regional approaches and disparate standards. But a distinct possibility was presented to

a world involved in the exchange of television programs to seek unison in one key area -- HDTV production. The goal was to seek the all-electronic emulation of what we have today in celluloid -- 35mm film -- which has been and continues to be the unified worldwide standard for high definition, high quality, origination of program material for the world's various color television production and transmission systems -- all 14 of them. A frame rate, somewhat alien to television systems, of 24 frames per second and a picture storage medium that is chemical rather than electronic serves us very well today. This medium works because manufacturers have developed complex converters to transform this single standard into the diverse television signal formats that were ultimately adopted in the various regions of the world. These converters are the telecine machines -- somewhat awkward and costly, but nevertheless acceptable on a global scale because they do the job. Their ingenious technology assures that the original program master itself -- the 35mm film -- can be passed unimpaired in metal cans across oceans and borders and converted to the appropriate television format. International program exchange today is relatively easy via this one unique medium, despite the proliferation of 14 different production and transmission systems for color television.

The early proponents of HDTV sought no less in their goal of universal program exchange made possible by a single, worldwide video production standard convertible to a variety of

transmission and distribution systems. From the beginning, the concept of a single, worldwide production standard presented a challenge never before confronted in television history: to choose one television signal format for program origination, acceptable to all regions, and electronically convert this signal to the emerging ATV transmission systems of the future, while also downconverting this same signal to all of today's present broadcast television systems. Electronic standards conversion for all was the central theme of those early discussions.

Equally central to this scenario was the cooperation and participation of the world's broadcasters, who would be obliged to put aside former philosophies and adopt a bold new global approach. This participation finally crystallized in the unanimous call from all of the nine broadcasting unions of the world at their Algiers meeting in 1983. This meeting culminated in the expression of a universal aversion to repeating within the new television era of HDTV the proliferation of diverse color television production and transmission technologies around the world that occurred in the 1960s -- the unfortunate legacy of which is well understood by program producers everywhere -- and the adoption of a resolution calling for a uniform production standard as the necessary first step to avoiding a repetition of this occurrence.

Today, however, with a dramatic resurgence of research and development ("R&D") in television around the world now

directed to grappling with the technical challenge of distributing this awesome electronic signal -- over the air, by cable, or via electronic packaged media -- a new and unfortunate narrowing of our sights has surfaced. No sooner was HDTV materializing in the form of real production equipment -- making real programs -- than a move to abandon the grand goal of only a few years before began to take place. In the U.S., for example, broadcasters have come to the recent realization that their particular medium -- 6 MHz of VHF and/or UHF spectrum -- is technically the most restrictive of all media and may place them at a competitive disadvantage relative to cable, satellite and VCR delivery systems. These competitive concerns unfortunately threaten to unravel the earlier consensus of the North American Broadcasting Union ("NAMBA") reached at Algiers. Regrettably, engineers in both the U.S. and in Europe are now arguing that HDTV program sources should be tailored to the unique transmission systems being developed for each region, thus disregarding the fundamental premise of a universal production standard. When one considers that within the U.S. alone, more than 20 ATV systems (embracing a variety of scanning formats) have been proposed, it is clear that substantial barriers to international communications could result from an insistence that diverse HDTV studio production standards be tied to specific transmission formats.

The long and singular work of the Society of Motion Picture and Television Engineers ("SMPTE"), which rallied the film and video communities in a joint examination of HDTV alternatives between 1982 and 1987, coupled with the parallel work of the Advanced Television Systems Committee ("ATSC"), came to fruition in early 1988 with the publishing of the SMPTE 240M HDTV production standard based on an 1125/60 scanning format. While hailed by many who had sought a high-performance, but pragmatic, electronic standard that would ensure successful syndication in any other distribution format anywhere in the world, this much refined standard was also assailed by some in the U.S. broadcasting community based on the erroneous belief that the standard is not "friendly" to the existing U.S. 525 system and because of confusion over its relation to the NHK MUSE standard.

Sony is concerned about the apparent move away from the goal espoused in Algiers and embodied in the SMPTE 240M standard. We, like many other international manufacturers, construed the urging of the Algiers Conference of Broadcasters as nothing less than a mandate to establish a uniform production standard that would ensure the viability of universal program exchange. Within CCIR, the same goal was strongly espoused. We, like many others, responded to this apparent unity with substantial investments in developing electronics standards converters for both the 50 Hz and 60 Hz regions of the world in order to bring to fruition all

of the major elements of an HDTV production system. Our commitment to the goal of a unified production standard has strengthened as we witness the specter of proliferating standards. To the contrary, we know even better today the powerful program capability of the much refined SMPTE 240M studio standard, a refinement which, significantly, took place in the U.S.

Sony currently develops and manufactures a very broad range of professional and broadcast products for the industrial and broadcast markets of all regions of the world. We know too well the enormous penalties associated with the curtailing of economies of scale in our manufacturing lines as we attempt to service all of the world's disparate color television systems. We witness too, at very close hand, the difficulties of exchanging television programs between continents and incompatible color television systems. The specter of a repetition of this disaster in the new era of HDTV appalls us. Perhaps our experience with the capabilities of modern digital technology allows us to believe, with a far greater confidence than many, that the challenge of electronic conversion to the various ATV distribution formats that presently exist or may eventually evolve -- the very premise upon which a single production standard is based -- will be mastered by an electronic technology that appears boundless.

The Commission recognizes the critical role of industry expertise and resources in the successful development of standards and has specifically encouraged continued industry participation in the FCC Advisory Committee and voluntary standards organizations such as the American National Standards Institute ("ANSI"), ATSC and the Electronics Industry Association ("EIA") in the search for ATV transmission standards. Further Notice, ¶ 121. Implicit in this recommendation is, we believe, the Commission's recognition of the enormous number and diversity of industries now involved in the examination of HDTV/ATV issues. Standards-setting for HDTV is a broader, more complex industry topic than was the formulation of the NTSC broadcast standards of an earlier time. Today, the destiny of the U.S. broadcaster is inextricably linked with the global explosion in electronic imaging -- with HDTV very much center stage. HDTV affects much more than the entertainment industry -- gigantic though that industry is. Standards for HDTV production must embrace all forms of high quality television production -- for motion pictures, television broadcasting, electronic cinemas, retail promotion, medicine, education, culture, business, and industry.

The world's broadcasting unions wisely requested in the early debate that HDTV studio production be given a first priority within international standards-setting bodies. Only by cleanly separating production issues from the more complex issues

associated with diverse transmission and distribution systems could there be any hope of achieving world-wide unanimity on a single HDTV television signal format for studio origination. In the U.S., we achieved this separation -- for a time. The anticipated difficulties surrounding electronic conversion of HDTV signals and the future relationship of film to video did indeed surface, but the marvelous American pragmatism and desire for progress overcame these early difficulties and produced the SMPTE 240M standard. U.S. broadcasters now appear, however, to have turned away from the goal of a uniform production standard because of their concerns about their long term role in ATV transmission, given the constraints imposed by the 6 MHz terrestrial transmission system. For all of the reasons discussed above, such concerns must not be permitted to overshadow the fundamental importance of developing a single uniform production standard.

C. Issues Surrounding Transmission and Distribution Standards

1. Repeal of the NTSC Standard

Sony agrees with the Commission's tentative conclusion that a relaxation of the NTSC standard at this time would be non-productive. Further Notice, ¶ 107. Because the industry and the Commission are still in the very early days of ATV development, it is premature to tamper with a standard that has served the industry and the American television audience well for so long

before the requisite information is developed to guide any such change.

We do draw attention, however, to the recent surge in activity among most receiver manufacturers to exploit the best of today's technology to improve the NTSC picture presented to the home viewer. We believe the early developments in the field of HDTV spurred this activity, and we perceive it as a very positive dynamic that directly benefits the American public. Nor do we see any cessation in this activity -- certainly not in our own labs. Indeed, the tentative ruling of the FCC that an ATV service must be compatible with the existing NTSC service will, we believe, stimulate further competitive activity in the technical enhancement of existing NTSC service.

Consequently, we believe it is important for the Commission to appreciate the interlocking nature of compatible ATV system developments and existing NTSC improvements and to adopt an activist, cooperative role with industry to exploit this relationship for the benefit of the American public. Specifically, the FCC must work with an industry that will seek, from time to time, temporary authorization to allow field trials of new innovations in NTSC receiver and ATV receiver systems. We recommend that any attendant requests for waivers in support of such activities be promptly and favorably reviewed. Similarly, we urge the Commission to take this opportunity to clarify that its equipment authorization procedures are not applicable to

prototype HDTV equipment which will not be marketed or sold to consumers, but rather will be operated exclusively in laboratory settings.

2. Establishment of Terrestrial ATV Transmission Standards

The Commission has tentatively concluded that it is premature for it to adopt a terrestrial ATV transmission standard, but that it must have a role in the development of standards with the advice and involvement of all sectors of the industry. Further Notice, ¶ 113. The Commission has also recognized the inherent tension between the benefits to be derived from setting a single standard (i.e., pointing all interested parties in the same direction, reducing the risks of investing in a single ATV system, increasing demand for ATV equipment) and the disadvantages of detailed, inflexible standards (i.e., reducing consumer choice and preventing the timely introduction of new technology). Id., ¶¶ 113-15.

Sony agrees that Commission participation in the development of standards is in the public interest. We strongly urge, however, that ATV standards be established based upon an industry consensus forged by affected industry groups, including the FCC Advisory Committee, EIA, ATSC, Advanced Television Test Center ("ATTC"), and the Cable Television Labs. This process of consensus-building leading to standards-setting worked very well in the establishment of the NTSC color system in the U.S.